Amendments to the Drawings:

The attached sheet of drawings includes changes to Figure 5. This sheet, which includes Figures 4 and 5, replaces the original sheet including Figures 4 and 5.

Attachment: Replacement Sheet

REMARKS

Claims 1, 2, 4-9, and 11-16 will be pending upon entry of the present amendment. Claims 1, 4, 11, and 13-15 are amended, and claims 3 and 10 are cancelled. No new matter has been added to the specification.

Claims 14-16 are objected to because of errors in claim dependency. In response to the Objection, claims 14 and 15 are amended to depend from claim 13.

Claims 6 and 9 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which the applicant regards as his invention. Claim 6 recites the limitation *kidney port* without sufficient antecedent basis. Claim 4 has therefore been amended to provide the necessary antecedence.

The Office Action indicates that the meaning of claim 9 is unclear in reciting first and second axes configured to "rotate in a plane around a common point, with respect to each other." The interpretation provided in the Office Action is that the axes are in a common plane and intersect in at least one point. This interpretation is substantially correct, but is not complete. Additionally, the first and second axes rotate with respect to each other.

To clarify the meaning of claim 9, Applicant points to Figures 1A-1C, which show a bent-axis motor 100 at various displacement angles. In practice, the thrust plate and cylinder barrel are coupled by a constant velocity joint, which is well known in the art, and is therefore not shown in the figures. The CV joint serves to constrain the thrust plate and cylinder barrel to a common rate of rotation around their respective axes. In Figure 1B the axes A and B are shown as being coaxial. However, Figures 1A and 1C show the axis A rotated with respect to axis B. Rotation of axis A relative to axis B around the point defined by the CV joint results in a change of displacement of the motor. This is described in more detail in the specification beginning at page 1, line 18. Figures 1A-1C illustrate the operation of a prior art device, but the meaning of the limitations of dependent claim 9 is clear in view of these figures and the accompanying text.

The specification has been amended to provide descriptive support for the amendments to claims 1, 4, 11, and 13. The added text describes features that are clearly shown in the figures and is thus fully supported by the specification as originally filed. Figure 5 has

been amended to included reference numerals 121, 121a, and 121b, which are used in the newly added text.

Claims 1-3 and 11-16 are rejected under 35 U.S.C. § 102(b) as being anticipated by Valentin (U.S. Patent 6,406,271), claims 4-6, 8, and 9 are rejected under 35 U.S.C. § 102(b) as being anticipated by Umeda et al. (U.S. Patent 6,186,748, hereafter *Umeda*), claims 4 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Valentin, and claim 7 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Umeda.

Claim 1 recites, in part, "first and second ports, each having a shape that describes a portion of a circle, formed in the valve plate and positioned such that the first and second ports define inner and outer circumferences of an annular region of the valve plate; a first pressure relief port located in the valve plate substantially outside of the annular region at a top-dead-center position; and a second pressure relief port located in the valve plate substantially outside of the annular region at a bottom-dead-center position ...." Valentin fails to anticipate these limitations of claim 1. The Office Action points to Valentin's main ports 73, 74, and its compensating ports 75, 76 as corresponding, respectively, to the ports and pressure relief ports of claim 1. Valentin's compensating ports 75, 76 are positioned in the same annular space defined by its main ports 73, 74, and "have the same or nearly the same width" (see Figure 10 and text at 12:56-59). Accordingly, Valentin does not anticipate first and second pressure relief ports located substantially outside of the annular region, as recited in claim 1. Claim 1 is therefore allowable over Valentin.

Valentin fails to anticipate the limitations of claim 2, which recites the first and second ports "configured to be selectively coupled to high- and low-pressure fluid sources or low- and high-pressure fluid sources respectively." As is known in the art, when the high- and low-pressure coupling of fluid ports of a hydraulic machine such as that recited in claim 1 are reversed, as recited in claim 2, the machine applies torque in the opposite direction, meaning that, in the case of a motor, rotation of a drive shaft reverses, while in the case of a pump, rotation of the pump shaft must also be reversed in order to pump fluid. Valentin's device is configured to rotate in only one direction, and so cannot anticipate claim 2. This can be clearly demonstrated with reference to Figures 9-9C and the accompanying text, beginning at column 12, line 27. In particular, it can be seen that not only are the bore channels tilted inwardly in a

radial direction, they are also tilted in a circumferential direction (see 12:38), which helps fluid to enter the bores with reduced turbulence during the suction stroke, which, according to Valentin, provides important advantages (see 12:35-36). If fluid pressure were reversed, suction would occur on the opposite side of the machine, resulting in a fluid flow counter to the tilt. Thus, the tilt of the bores would result in more turbulence, not less, and would defeat the intent of the design. Accordingly, Valentin is not configured to be selectively coupled as recited in claim 2, and therefore cannot anticipate its limitations. Claim 2 is therefore allowable on its own merits, apart from its allowability as depending from an allowable base claim.

Claim 11 recites, in part, "means for equalizing fluid pressure in pairs of the plurality of cylinders on opposite sides of the circular arrangement after the cylinder ports of each pair of cylinders begin to cross top-dead-center and bottom-dead-center of rotation, respectively." Valentin fails to anticipate at least this limitation of claim 11. The Office Action points to Valentin's piston bores 9 as corresponding to the cylinders of claim 11, so Applicant assumes that the Examiner would point to the bore channels 17 (Figure 9) as logically corresponding to the cylinder ports of amended claim 11. Referring to Valentin's Figure 10, it can be seen that the compensating ports 75 and 76 lie in the same annular path 78 as the main ports 73 and 74. Thus, as the bore channels 17 rotate around the valve plate 16 along the path 78, they will contact the compensating ports 75, 76 before they begin to cross top- or bottom-dead-center (I-I in Valentin's Figure 10), and so Valentin's pressure compensation will also occur before the bore channels begin to cross top- or bottom-dead-center, rather than after, as recited in claim 11. Accordingly, Valentin fails to anticipate each element of claim 11, which is therefore allowable.

Claim 13 recites, in part, "placing a first cylinder, after the first cylinder begins to cross top-dead-center of rotation, in fluid communication with a second cylinder, after the second cylinder begins to cross bottom-dead-center of rotation." Valentin fails to anticipate this limitation of claim 13. As can be seen with reference to Figure 10, because of the placement of its compensating ports 75 and 76 Valentin's device places each of its bore channels 17 in contact with its compensating ports 75 and 76 *before* the respective channels reaches top- or bottom-dead-center, rather than *after*, as recited in claim 13. Accordingly, Valentin does not anticipate each of the limitations of claim 11, which is therefore allowable

Claim 4 recites, in part, "an even numbered plurality of cylinders formed in the cylinder barrel. Umeda fails to anticipate at least this limitation of claim 4. Umeda employs an odd number of cylinders, as can be seen clearly at Figure 2, which shows the openings C1-C9 on the face of the cylinder block 2, each of which communicates with a respective piston chamber, i.e., cylinder. Thus, as there are nine openings, there are also nine cylinders.

Umeda cannot anticipate the limitations of dependent claim 5, which recites the plurality of cylinder ports including "a vent notch positioned such that when the respective cylinder port is at the top-dead-center or bottom-dead-center of rotation, the vent notch is coupled to the first or second pressure relief port, respectively." In particular, Umeda's bypass port M2 is not positioned at top-dead-center, but is instead located to one side (see Figures 2 and 4A-4C), so that when one of the openings C1-C9 is at top-dead-center, the notch "e" will not be coupled to the bypass port M2 as recited in claim 5. It is only after the opening rotates beyond top-dead-center that the notch e contacts the bypass port M2 (see column 7, lines 55-59). Thus, the limitations of claim 5 are not anticipated by Umeda.

Claim 6 recites that "the valve plate and cylinder barrel are configured such that, as the cylinder barrel rotates over the valve plate, each cylinder port, in turn, breaks fluid communication with the first kidney port and enters fluid communication with the first pressure relief port substantially simultaneously, while an opposing cylinder port breaks fluid communication with the second kidney port and enters fluid communication with the second pressure relief port, also substantially simultaneously. Umeda does not anticipate the limitations of claim 6. This can be seen with reference to Figures 4A and 4B. In Figure 4A, opening C1 is shown at 10° before bottom-dead-center, while in Figure 4B, opening C5 is shown at 10° before top-dead-center. In comparing these two positions, it can be seen that the trailing edges of the respective openings C1 and C5 appear to have about an equal remaining overlap with the respective ports S and T. However, comparing the distance the openings C1 and C5 must each travel to make contact with the respective bypass channels M1, M2, it can be seen that the distance between the notch of the opening C1 and the bypass channel M1 as shown in Figure 4A is clearly less than the distance between the notch of the opening C5 and the bypass channel M2 as shown in Figure 4B. This being the case, the timing between when each opening breaks communication with the respective port and enters fluid communication with the respective

bypass channel will be different. Thus, if, for example, the opening C1 breaks fluid communication with the port S and enters fluid communication with bypass channel M1 substantially simultaneously (which is neither explicitly disclosed nor inherent in Umeda's disclosure), opening C5 clearly will not, but will instead break fluid communication with the port T before it enters fluid communication with bypass channel M2. Umeda cannot, therefore anticipate the limitations of claim 6.

Claim 7 recites, "a plurality of vent apertures formed in the barrel face, each aperture being in fluid communication with a respective one of the plurality of cylinder ports and positioned in the barrel face such that when each cylinder port is at the top-dead-center or bottom-dead-center of rotation, the respective vent aperture is coupled to the first or second pressure relief port, respectively." In rejecting claim 7 under § 103, the Office Action states that modifying Umeda's notches is a mere change in shape, and constitutes an obvious design choice. Applicant respectfully traverses this position. In reviewing Figures 4A-4C, it can be seen that during the passage of an opening across a bypass channel, the opening first contacts the channel at the notch, but, because of the slant of the channel relative to the path of the opening, the notch remains in contact with the body of the opening after the notch passes, as shown in Figure 4B, where it can be seen that bypass channel M1 is no longer in contact with the notch of opening C1, but is in nevertheless still in fluid communication with the body of the opening. If the notches were replaced with vent apertures, which would inherently be spaced away from the openings, the flow characteristics between the openings and the channels would be significantly different, and the repositioned vents might result in the bypass channels breaking contact with the vent apertures before making contact with the associated openings. The shape of the bypass channels would need to be modified to compensate, and other unforeseen complications could easily arise, affecting the pressure cycle discussed with reference to Figure 5. Umeda offers no discussion as to whether such an arrangement would result in proper fluid flow characteristics as taught, how one would adjust other aspects of the system to compensate, nor whether the pressure curves shown in Figure 5 would be obtainable. The notches as taught are fundamental to proper operation of Umeda's system. Changes to the shape or configuration of the openings or bypass channels could easily change the entire principle of operation of the device, or even render it unsuitable for its intended purpose. Finally, without the disclosure of the present application as reference, one of ordinary skill

in the art would find no motivation or reason to change the notches to vents, inasmuch as Umeda is entirely silent about changes in shape or configuration. Clearly, the vent apertures of claim 7 are not obvious in view of Umeda, and are patentable thereover.

Claim 9 recites, in part, "a second axis, around which the thrust plate is configured to rotate." Umeda's is a swash plate type hydraulic machine. As such, the swash plate 4, which is the closest element, functionally, to the thrust plate of a bent axis machine, does no rotate. Accordingly, Umeda fails to anticipate this limitation of claim 9, which is thus allowable.

Finally, Applicant notes that a combination of elements of Valentin with Umeda, or vice-versa, for the purpose of rejecting claims under § 103 would be inappropriate, inasmuch as the principles of operation of the two references are not compatible. For example, Umeda's system requires an odd number of cylinders while Valentin's requires an even number; Umeda's bypass channels are directly coupled to one or the other of the fluid supply ports, while Valentin's compensating ports are coupled together; and Umeda's system will inherently result in a relative increase in leakage of fluid from the high-pressure side to the low, as some fluid will escape each time an opening bridges between a bypass channel and a conduit (L1, L2), as shown with opening C1 in Figure 4B, while Valentin seeks to reduce fluid leakage and pressure losses by employing the compensating ports (see column 13, lines 3-7), and avoiding features of the type used by Umeda that sacrifice pressure loss for noise reduction (see 4:19-30).

Overall, the cited references do not singly, or in any motivated combination, teach or suggest the claimed features of the embodiments recited in independent claims 1, 4, 11, or 13, and thus such claims are allowable. While many of the dependent claims were shown to be allowable over the prior art, Applicant's decision not to argue the allowability of each of the dependent claims is not to be construed as an admission that such claims would not be allowable but for their dependence on allowable base claims, and Applicant reserve the right to present such arguments as may become necessary in the future. If the undersigned representative has overlooked a relevant teaching in any of the references, the Examiner is requested to point out specifically where such teaching may be found.

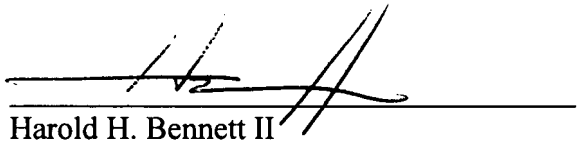
In light of the above amendments and remarks, Applicant respectfully submits that all pending claims are allowable, and therefore respectfully requests that the Examiner reconsider this application and timely allow all pending claims. Examiner Hamo is encouraged

to contact Mr. Bennett by telephone at (206) 694-4848 to discuss the above and any other distinctions between the claims and the applied references, if desired. If the Examiner notes any informalities in the claims, he is encouraged to contact Mr. Bennett by telephone to expeditiously correct such informalities.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

Respectfully submitted,

SEED Intellectual Property Law Group PLLC



Harold H. Bennett II
Registration No. 52,404

HHB:wt/dma/cm

Enclosure:
1 Sheet of Replacement Drawings (Figures 4-5)

701 Fifth Avenue, Suite 5400
Seattle, Washington 98104
Phone: (206) 622-4900
Fax: (206) 682-6031

965643_1.DOC